



1

SEQUENCE LISTING

<110> BRINGMANN, PETER W.
FAULDS, DARYL
MITROVIC, BRANISLAVA
SRINIVASAN, SUBHA

<120> NOVEL FIBROBLAST GROWTH FACTORS

<130> BERLX 87

<140> 10/005,646

<141> 2001-12-07

<150> 60/251,837

<151> 2000-12-08

<160> 16

<170> PatentIn Ver. 2.1

<210> 1

<211> 636

<212> DNA

<213> Unknown Organism

<220>

<221> CDS

<222> (1)..(633)

<220>

<223> Description of Unknown Organism: FGF-21 nucleotide sequence

<400> 1

atg gct ccc tta gcc gaa gtc ggg ggc ttt ctg ggc ggc ctg gag ggc 48
Met Ala Pro Leu Ala Glu Val Gly Gly Phe Leu Gly Gly Leu Glu Gly
1 5 10 15

ttg ggc cag cag gtg ggt tcg cat ttc ctg ttg cct cct gcc ggg gag 96
Leu Gly Gln Gln Val Gly Ser His Phe Leu Leu Pro Pro Ala Gly Glu
20 25 30

cgg ccg ccg ctg ctg ggc gag cgc agg agc gcg gcg gag cgg agc gcg 144
Arg Pro Pro Leu Leu Gly Glu Arg Arg Ser Ala Ala Glu Arg Ser Ala
35 40 45

cgc ggc ggg ccg ggg gct gcg cag ctg gcg cac ctg cac ggc atc ctg 192
Arg Gly Pro Gly Ala Ala Gln Leu Ala His Leu His Gly Ile Leu
50 55 60

cgc cgc cgg cag ctc tat tgc cgc acc ggc ttc cac ctg cag atc ctg 240
Arg Arg Arg Gln Leu Tyr Cys Arg Thr Gly Phe His Leu Gln Ile Leu
65 70 75 80

ccc gac ggc agc gtg cag ggc acc cgg cag gac cac agc ctc ttc ggt 288
Pro Asp Gly Ser Val Gln Gly Thr Arg Gln Asp His Ser Leu Phe Gly
85 90 95

atc ttg gaa ttc atc agt gtg gca gtg gga ctg gtc agt att aga ggt Ile Leu Glu Phe Ile Ser Val Ala Val Gly Leu Val Ser Ile Arg Gly	336
100 105 110	
gtg gac agt ggt ctc tat ctt gga atg aat gac aaa gga gaa ctc tat Val Asp Ser Gly Leu Tyr Leu Gly Met Asn Asp Lys Gly Glu Leu Tyr	384
115 120 125	
gga tca gag aaa ctt act tcc gaa tgc atc ttt agg gag cag ttt gaa Gly Ser Glu Lys Leu Thr Ser Glu Cys Ile Phe Arg Glu Gln Phe Glu	432
130 135 140	
gag aac tgg tat aac acc tat tca tct aac ata tat aaa cat gga gac Glu Asn Trp Tyr Asn Thr Tyr Ser Ser Asn Ile Tyr Lys His Gly Asp	480
145 150 155 160	
act ggc cgc agg tat ttt gtg gca ctt aac aaa gac gga act cca aga Thr Gly Arg Arg Tyr Phe Val Ala Leu Asn Lys Asp Gly Thr Pro Arg	528
165 170 175	
gat ggc gcc agg tcc aag agg cat cag aaa ttt aca cat ttc tta cct Asp Gly Ala Arg Ser Lys Arg His Gln Lys Phe Thr His Phe Leu Pro	576
180 185 190	
aga cca gtg gat cca gaa aga gtt cca gaa ttg tac aag gac cta ctg Arg Pro Val Asp Pro Glu Arg Val Pro Glu Leu Tyr Lys Asp Leu Leu	624
195 200 205	
atg tac act tga Met Tyr Thr 210	636

<210> 2
<211> 211
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: FGF-21 amino acid sequence

<400> 2	
Met Ala Pro Leu Ala Glu Val Gly Gly Phe Leu Gly Gly Leu Glu Gly	15
1 5 10	
Leu Gly Gln Gln Val Gly Ser His Phe Leu Leu Pro Pro Ala Gly Glu	30
20 25 30	
Arg Pro Pro Leu Leu Gly Glu Arg Arg Ser Ala Ala Glu Arg Ser Ala	45
35 40 45	
Arg Gly Gly Pro Gly Ala Ala Gln Leu Ala His Leu His Gly Ile Leu	60
50 55 60	
Arg Arg Arg Gln Leu Tyr Cys Arg Thr Gly Phe His Leu Gln Ile Leu	80
65 70 75 80	

Pro Asp Gly Ser Val Gln Gly Thr Arg Gln Asp His Ser Leu Phe Gly
 85 90 95

Ile Leu Glu Phe Ile Ser Val Ala Val Gly Leu Val Ser Ile Arg Gly
 100 105 110

Val Asp Ser Gly Leu Tyr Leu Gly Met Asn Asp Lys Gly Glu Leu Tyr
 115 120 125

Gly Ser Glu Lys Leu Thr Ser Glu Cys Ile Phe Arg Glu Gln Phe Glu
 130 135 140

Glu Asn Trp Tyr Asn Thr Tyr Ser Ser Asn Ile Tyr Lys His Gly Asp
 145 150 155 160

Thr Gly Arg Arg Tyr Phe Val Ala Leu Asn Lys Asp Gly Thr Pro Arg
 165 170 175

Asp Gly Ala Arg Ser Lys Arg His Gln Lys Phe Thr His Phe Leu Pro
 180 185 190

Arg Pro Val Asp Pro Glu Arg Val Pro Glu Leu Tyr Lys Asp Leu Leu
 195 200 205

Met Tyr Thr
 210

<210> 3

<211> 513

<212> DNA

<213> Unknown Organism

<220>

<221> CDS

<222> (1)..(510)

<220>

<223> Description of Unknown Organism: FGF-23 nucleotide sequence

<400> 3

atg cgc cgc cgc ctg tgg ctg ggc ctg gcc tgg ctg ctg ctg gcg cgg	48
Met Arg Arg Arg Leu Trp Leu Gly Leu Ala Trp Leu Leu Ala Arg	
1 5 10 15	

gcg ccg gac gcc gcg gga acc ccg agc gcg tcg cgg gga ccg cgc agc	96
Ala Pro Asp Ala Ala Gly Thr Pro Ser Ala Ser Arg Gly Pro Arg Ser	
20 25 30	

tac ccg cac ctg gag ggc gac gtg cgc tgg cgg cgc ctc ttc tcc tcc	144
Tyr Pro His Leu Glu Gly Asp Val Arg Trp Arg Arg Leu Phe Ser Ser	
35 40 45	

act cac ttc ttc ctg cgc gtg gat ccc ggc ggc cgc gtg cag ggc acc	192
Thr His Phe Phe Leu Arg Val Asp Pro Gly Gly Arg Val Gln Gly Thr	
50 55 60	
cgc tgg cgc cac ggc cag gac atc ctg gag atc cgc tct gta cac	240
Arg Trp Arg His Gly Gln Asp Ser Ile Leu Glu Ile Arg Ser Val His	
65 70 75 80	
gtg ggc gtc gtg gtc atc aaa gca gtg tcc tca ggc ttc tac gtg gcc	288
Val Gly Val Val Ile Lys Ala Val Ser Ser Gly Phe Tyr Val Ala	
85 90 95	
atg aac cgc cgg ggc cgc ctc tac ggg tcg cga ctc tac acc gtg gac	336
Met Asn Arg Arg Gly Arg Leu Tyr Gly Ser Arg Leu Tyr Thr Val Asp	
100 105 110	
tgc agg ttc cgg gag cgc atc gaa gag aac ggc cac aac acc tac gcc	384
Cys Arg Phe Arg Glu Arg Ile Glu Glu Asn Gly His Asn Thr Tyr Ala	
115 120 125	
tca cag cgc tgg cgc cgc ggc cag ccc atg ttc ctg gcg ctg gac	432
Ser Gln Arg Trp Arg Arg Gly Gln Pro Met Phe Leu Ala Leu Asp	
130 135 140	
agg agg ggg ggg ccc cgg cca ggc ggc cgg acg cgg cgg tac cac ctg	480
Arg Arg Gly Gly Pro Arg Pro Gly Gly Arg Thr Arg Arg Tyr His Leu	
145 150 155 160	
tcc gcc cac ttc ctg ccc gtc ctg gtc tcc tga	513
Ser Ala His Phe Leu Pro Val Leu Val Ser	
165 170	

<210> 4
<211> 170
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: FGF-23 amino acid sequence

<400> 4	
Met Arg Arg Arg Leu Trp Leu Gly Leu Ala Trp Leu Leu Leu Ala Arg	
1 5 10 15	
Ala Pro Asp Ala Ala Gly Thr Pro Ser Ala Ser Arg Gly Pro Arg Ser	
20 25 30	
Tyr Pro His Leu Glu Gly Asp Val Arg Trp Arg Arg Leu Phe Ser Ser	
35 40 45	
Thr His Phe Phe Leu Arg Val Asp Pro Gly Gly Arg Val Gln Gly Thr	
50 55 60	
Arg Trp Arg His Gly Gln Asp Ser Ile Leu Glu Ile Arg Ser Val His	
65 70 75 80	

Val Gly Val Val Val Ile Lys Ala Val Ser Ser Gly Phe Tyr Val Ala
85 90 95
Met Asn Arg Arg Gly Arg Leu Tyr Gly Ser Arg Leu Tyr Thr Val Asp
100 105 110
Cys Arg Phe Arg Glu Arg Ile Glu Glu Asn Gly His Asn Thr Tyr Ala
115 120 125
Ser Gln Arg Trp Arg Arg Gly Gln Pro Met Phe Leu Ala Leu Asp
130 135 140
Arg Arg Gly Gly Pro Arg Pro Gly Gly Arg Thr Arg Arg Tyr His Leu
145 150 155 160
Ser Ala His Phe Leu Pro Val Leu Val Ser
165 170

<210> 5
<211> 208
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: FGF-9 amino acid sequence

<400> 5
Met Ala Pro Leu Gly Glu Val Gly Asn Tyr Phe Gly Val Gln Asp Ala
1 5 10 15
Val Pro Phe Gly Asn Val Pro Val Leu Pro Val Asp Ser Pro Val Leu
20 25 30
Leu Ser Asp His Leu Gly Gln Ser Glu Ala Gly Gly Leu Pro Arg Gly
35 40 45
Pro Ala Val Thr Asp Leu Asp His Leu Lys Gly Ile Leu Arg Arg Arg
50 55 60
Gln Leu Tyr Cys Arg Thr Gly Phe His Leu Glu Ile Phe Pro Asn Gly
65 70 75 80
Thr Ile Gln Gly Thr Arg Lys Asp His Ser Arg Phe Gly Ile Leu Glu
85 90 95
Phe Ile Ser Ile Ala Val Gly Leu Val Ser Ile Arg Gly Val Asp Ser
100 105 110
Gly Leu Tyr Leu Gly Met Asn Glu Lys Gly Glu Leu Tyr Gly Ser Glu
115 120 125
Lys Leu Thr Gln Glu Cys Val Phe Arg Glu Gln Phe Glu Glu Asn Trp
130 135 140

Tyr Asn Thr Tyr Ser Ser Asn Leu Tyr Lys His Val Asp Thr Gly Arg
145 150 155 160

Arg Tyr Tyr Val Ala Leu Asn Lys Asp Gly Thr Pro Arg Glu Gly Thr
165 170 175

Arg Thr Lys Arg His Gln Lys Phe Thr His Phe Leu Pro Arg Pro Val
180 185 190

Asp Pro Asp Lys Val Pro Glu Leu Tyr Lys Asp Ile Leu Ser Gln Ser
195 200 205

<210> 6

<211> 207

<212> PRT

<213> Unknown Organism

<220>

<223> Description of Unknown Organism: FGF-16 amino acid sequence

<400> 6

Met Ala Glu Val Gly Gly Val Phe Ala Ser Leu Asp Trp Asp Leu His
1 5 10 15

Gly Phe Ser Ser Ser Leu Gly Asn Val Pro Leu Ala Asp Ser Pro Gly
20 25 30

Phe Leu Asn Glu Arg Leu Gly Gln Ile Glu Gly Lys Leu Gln Arg Gly
35 40 45

Ser Pro Thr Asp Phe Ala His Leu Lys Gly Ile Leu Arg Arg Arg Gln
50 55 60

Leu Tyr Cys Arg Thr Gly Phe His Leu Glu Ile Phe Pro Asn Gly Thr
65 70 75 80

Val His Gly Thr Arg His Asp His Ser Arg Phe Gly Ile Leu Glu Phe
85 90 95

Ile Ser Leu Ala Val Gly Leu Ile Ser Ile Arg Gly Val Asp Ser Gly
100 105 110

Leu Tyr Leu Gly Met Asn Glu Arg Gly Glu Leu Tyr Gly Ser Lys Lys
115 120 125

Leu Thr Arg Glu Cys Val Phe Arg Glu Gln Phe Glu Glu Asn Trp Tyr
130 135 140

Asn Thr Tyr Ala Ser Thr Leu Tyr Lys His Ser Asp Ser Glu Arg Gln
145 150 155 160

Tyr Tyr Val Ala Leu Asn Lys Asp Gly Ser Pro Arg Glu Gly Tyr Arg
165 170 175

Thr Lys Arg His Gln Lys Phe Thr His Phe Leu Pro Arg Pro Val Asp
180 185 190

Pro Ser Lys Leu Pro Ser Met Ser Arg Asp Leu Phe His Tyr Arg
195 200 205

<210> 7
<211> 117
<212> PRT
<213> Unknown Organism

<220>
<223> Description of Unknown Organism: FGF-22

```
<220>
<221> MOD_RES
<222> (1)
<223> Any amino acid
```

```

<400> 7
Xaa Gly Met Leu Ala Ser Tyr Ser Val Ala Val Ala Met Val Thr Thr
          1           5           10          15

```

Arg Gly Val Ala Ser Arg Leu Tyr Leu Asp Ser Asn His Lys Gly Asp
20 25 30

Leu Tyr Ala Ser Val Arg Leu Ala Gln Glu Ser Val Phe Trp Gly Gln
35 40 45

Ser Glu Glu Asn Trp Ser Tyr Thr His Ser Ser Asn Leu Tyr Lys His
50 55 60

Val	Asp	Thr	Arg	Arg	Arg	Tyr	Tyr	Val	Pro	Leu	Asn	Gln	Gly	Ala	Thr
65						70				75					80

Pro Ser Ala Gly Thr Arg Ser Leu Arg Arg Gln Asn Tyr Thr His Val
85 90 95

Leu Pro Arg Pro Val Asp Pro Asp Lys Val Pro Glu Leu Tyr Lys Asp
100 105 110

Ile Leu Ser Gln Ser
115

<210> 8
<211> 208
<212> PRT
<213> *Xenopus laevis*

<400> 8
Met Ala Pro Leu Ala Asp Val Gly Thr Phe Leu Gly Gly Tyr Asp Ala
1 5 10 15

Leu Gly Gln Val Gly Ser His Phe Leu Leu Pro Pro Ala Lys Asp Ser
20 25 30

Pro Leu Leu Phe Asn Asp Pro Leu Ala Gln Ser Glu Arg Leu Ser Arg
35 40 45

Ser Ala Pro Ser Asp Leu Ser His Leu Gln Gly Ile Leu Arg Arg Arg
50 55 60

Gln Leu Tyr Cys Arg Thr Gly Phe His Leu Gln Ile Leu Pro Asp Gly
65 70 75 80

Asn Val Gln Gly Thr Arg Gln Asp His Ser Arg Phe Gly Ile Leu Glu
85 90 95

Phe Ile Ser Val Ala Ile Gly Leu Val Ser Ile Arg Gly Val Asp Thr
100 105 110

Gly Leu Tyr Leu Gly Met Asn Asp Lys Gly Glu Leu Phe Gly Ser Glu
115 120 125

Lys Leu Thr Ser Glu Cys Ile Phe Arg Glu Gln Phe Glu Glu Asn Trp
130 135 140

Tyr Asn Thr Tyr Ser Ser Asn Leu Tyr Lys His Gly Asp Ser Gly Arg
145 150 155 160

Arg Tyr Phe Val Ala Leu Asn Lys Asp Gly Thr Pro Arg Asp Gly Thr
165 170 175

Arg Ala Lys Arg His Gln Lys Phe Thr His Phe Leu Pro Arg Pro Val
180 185 190

Asp Pro Glu Lys Val Pro Glu Leu Tyr Lys Asp Leu Met Gly Tyr Ser
195 200 205

<210> 9

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Illustrative peptide

<400> 9

Leu Tyr Gly Ser

1

<210> 10

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Illustrative peptide

<400> 10

His Phe Leu Pro

1

<210> 11
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Illustrative peptide

<400> 11
Val Gln Gly Thr Arg
1 5

<210> 12
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Illustrative peptide

<400> 12
Arg Ile Glu Glu Asn Gly His Asn Thr Tyr
1 5 10

<210> 13
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Illustrative peptide

<400> 13
Gln Phe Glu Glu Asn Trp Tyr Asn Thr Tyr
1 5 10

<210> 14
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Illustrative peptide

<400> 14
Ala Gly Thr Pro Ser Ala
1 5

<210> 15

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Illustrative
peptide

<400> 15

Ala Ala Glu Arg Ser Ala

1

5

<210> 16

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: 6X His tag

<400> 16

His His His His His His

1

5